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Of The American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursdays of each month, excepting June, July, August, November and December, and on the third Thursdays of November and December.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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ENTOMOLOGICAL NEWS

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The Butterflies of Avon, Connecticut (Lepid., Rhopalocera).

By ROSWELL C. WILLIAMS, Jr., Philadelphia, Pennsylvania.

During the years 1902 to 1914 I spent from two to four week-ends each season in my Mother's home in Avon, Connecticut, collecting and observing the butterflies that were flying in that locality, and I publish herewith a list of the species captured and their time of appearance as observed by me during that period. I was in Avon at one time or another throughout the season with exception of the last two weeks in September.

The house is on the side of a hill known as Talcott Mountain and at an elevation of about three hundred feet, the top of the mountain having an elevation of about seven hundred and fifty feet. The collecting was all done within a mile's radius of my Mother's home. Avon is eight miles west of Hartford and seven miles north of Farmington, Connecticut. While this list probably does not include all of the species that may be found there, it is, at any rate, a definite record of actual captures. Some of the insects were only seen once. *Anthocharis genutia* is represented by a single female, which was caught on the front porch. The most northern previous record that I am familiar with is New Haven, Connecticut, as recorded by Mr. Scudder. *Satyrodes canthus* was only observed once, but there were several individuals flying.

Pieris protodice was not observed until 1911, and then it appeared to be somewhat abundant. A small, swampy lot of a few acres back of the house, having an abundant growth of wild flowers, would sometimes be fairly alive with the Argynnids and *idalia* was always abundant.

The accompanying list shows the distribution of the species for each of the four weeks of each month.

The nomenclature used is that of the Barnes & McDunnough list, except for some changes I have made in the names of the Hesperiidae.

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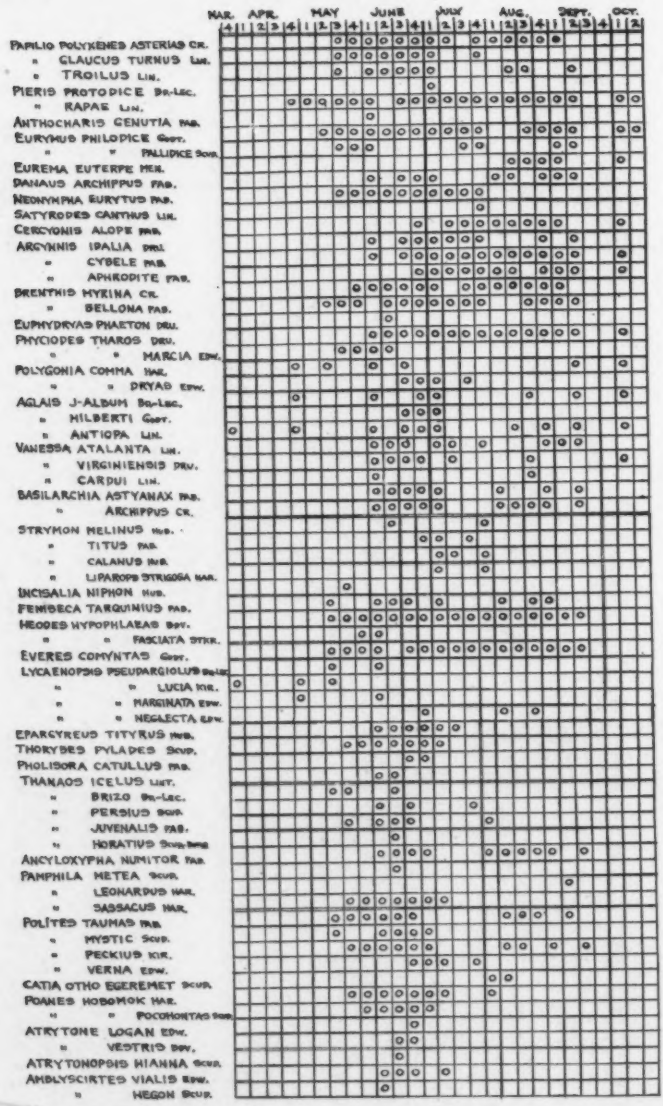

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Landmarks in the History of the Study of Insect Hibernation.

By NELLIE M. PAYNE, University of Minnesota.

It is a far cry from the simple observations of an Aristotle that insects do hibernate to the refined measurements of the Danish physiologist, Krogh, on the rate of metabolism during hibernation. This tiny portion of the great field of physiology has already yielded varied and interesting results.

The first landmark in the history of the study of insect hibernation is the work of Aristotle. He knew that insects hibernated in a state of torpor.

The Roman period and the dark ages of science we pass by to come upon the work of Réaumur and Huber. These workers deserve a high rank among the pioneers in experimental and observational entomology. It is surprising to see how modern, how accurate, and how ingenious were the methods used by these workers, the former nearly two hundred years ago. The observations of Réaumur and Huber on the hibernation of bees stand out with amazing force and freshness. Réaumur also did the first quantitative experiment to determine the exact degree of low temperature which insects can endure and still live. His material was larvae found in wood. His method was to place these larvae in thin glass tubes in freezing mixtures of marine salt and water. He recorded the temperature of the freezing mixture by means of the thermometer which he, himself, had lately invented. Réaumur is known to biologists as a lover of pure science and often thought to be a scholarly recluse. Yet a careful study of his life shows that he was a busy man of affairs. He held the offices which today would be the equivalent of the National Research Council Chairmanship, the Secretaryships of Commerce and of the Interior, besides managing his own large estates.

The next workers along the path are Englishmen, Kirby and Spence (1818). They devote a chapter of thirty-five pages to a study of insect torpidity and insect hibernation. They ascribe the hibernation of insects to a provision of the allwise Creator against a time of want. Not content with mere

philosophizing these authors perform some experiments on the hibernation of bees. They also sum up the work of preceding authors.

The next significant landmark is the work of Vaudoner (1827) on the lethargy of caterpillars. Vaudoner emphasized the periodicty of hibernation. He was one of the first workers to state clearly that insects could go into a state of hibernation when the temperature was still high and the food supply was plentiful. The work of Vaudoner has been overlooked by many later biologists but is suggestive of the possibility of experimentation along many lines relating to lethargy and hibernation.

Along with the advance in experimentation in the acquiring of knowledge comes the invention and perfection of instruments of precision. Nobili and Melloni (1833-4) were the first workers to use the thermocouple method to determine the temperature of insects. This instrument had been devised by Seebeck about ten years previous.

One of our own countrymen, Scudder (1887), deserves to stand as a landmark in this smaller field of insect study under consideration as he does in the larger fields of paleontology and taxonomy. His treatise on insect hibernation and insect lethargy forms the subject of two excursus in his *Butterflies of the Eastern United States and Canada.*

The next outstanding worker is Bachmetjew. He summarized the literature of the preceding workers, made extensive additions of his own and analyzed the data thus obtained to make one coherent theory of the vital temperature minimum of insects. He used the thermocouple method to determine the freezing point of insects. He published his results from 1898 to 1901, this last date marking the publication of his monumental work, *Experimentelle entomologische Studien vom physicalisch-chemischen Standpunkt aus,* Band. I. We can say monumental, although the volume contains but one hundred and sixty pages. The new viewpoint that is expressed in the title so clearly, that no one can fail to grasp the import, is the quality that makes this book outstanding. Quantitative physicochemical entomology was now possible.

Krogh in Denmark forms another outstanding worker. His use of insect material in the study of quantitative physiology demonstrates a few of the great possibilities present in the investigation of insect material. Krogh's (1914) measurements of rate of metabolism at low temperatures and during hibernation are an expression of the quantitative study of hibernation, which has already yielded varied and interesting results.

Only a few of those who have contributed to the study of hibernation have here been mentioned, and only those who lay in the direct line of development as near as that line can be ascertained today. To the workers of today in the new field of insect hibernation, it may be well to point out that there were earnest investigators two hundred years ago in this same field. To these pioneers we must give credit and also learn something at least from their worthy efforts.

Migrations of the Long-Beaked Butterfly, Libythea bachmani Kirtland (Lepid.: Libytheidae).[1]

By D. C. PARMAN, Assistant Entomologist, Bureau of Entomology, United States Department of Agriculture.

Since the establishment of the laboratory at Uvalde, Texas. in the fall of 1913 by the United States Bureau of Entomology, the Long-beaked Butterfly has frequently been observed. It is thought that a brief record of these observations may be of value to those interested in the study of insect behavior. No general flights of the long-beaked butterflies were noted until the summer of 1916; a few small flights occurred during the summer of 1917 and a few specimens were seen in 1918, but no flights of consequence were observed that year. A considerable number of these butterflies appeared in migration during the summer of 1921, but all of these flights were very small compared with the flights of 1916.

It has not been possible to correlate the climatic conditions of the two years with the flights. The summer of 1916 was com-

[1]Approved for publication by the chief of the Bureau of Entomology, United States Department of Agriculture.

paratively rainy and rather cool, whereas the summer of 1921 was relatively hot and dry. The migrations observed during both years took place in the month of August, always after rains, which were generally light as compared to other rains of the season. Butterflies have been observed in large numbers during other years in the bottoms along the streams and in low valleys, but apparently no migrations took place. The number of butterflies which took part in the migrations of 1916 is almost unbelievable.

The amount of rainfall in inches for the period during which the writer has been stationed at Uvalde was as follows: for 1914, 21.18; 1915, 13.65; 1916, 33.34; 1917, 11.80; 1918, 12.00; 1919, 38.52; 1920, 18.24; 1921, 17.86; 1922, 20.95; 1923, 29.84; 1924, 15.68.

The precipitation by days during the months from May to September of the two years when large migrations occurred was as follows, in inches:

1916. May 1 .28, 2 .22, 18 .28, 20 (trace), 21 .77, total 1.55. June 15 .58, 16 .05, 30 .09, total .72. July 5 .5, 9 1.77, 14 .68, 21 .4, 23 .37, 27 .6, 28 .92, 30 .15, 31 .51, total 6.20. August 1 1.3, 6 (trace), 7 .4, 16, 17 (trace each), 19 3.1, 21 .4, 24 (trace), 28 2.0, total 7.20. September 1 3.01, 2 2.01, 13 .35, 14 .25, total 5.62.

1921. May 1 2.4, 10 (trace), 11 .3, 15 .8, 16 .06, 17 1.68, total 5.22. June 3 .2, 8 (trace), 10 .05, 12 .5, 13 1.73, 14 .4, 15 .04, total 2.92. July 6 (trace), 7 .42, 8 .22, 11 .3, 30 .22, total 1.16. August 28 .19, 29 .1, total .29 September 8 .33, 9 .61, 11 .02, 29 .24, total 1.20.

Migrations of 1916

During the early part of the summer and early fall of 1916, large numbers of many species of Lepidoptera were present in the vicinity of Uvalde. Butterflies were by far the most conspicuous and were probably the most abundant. The roadsides were lined with them and reports were received of automobile radiators becoming clogged with them to the extent of stopping the air circulation sufficiently to cause the engine to overheat. The writer took many mutilated specimens from radia-

tors, but never observed a radiator with a sufficient number on it to interfere seriously with cooling. *Libythea bachmani* was probably the predominating species, but several others were almost as abundant and were more noticeable in the roads; *L. bachmani* kept more to the heavy growths of grasses, weeds and timber, and in low moist places it was the only species observed to make definite migratory flights.

The first migration occurred August 1; the last, August 28. Many individuals were observed before and after the above dates. A single one was found November 10, about 4 p. m. in the warm sun on the west side of the insectary in a semi-stupor, but was fresh in appearance and unmutilated. This was the last observed during the fall. It was found dead on the ground the next morning.

The flights always took place in the afternoon and generally from 4 p. m. to 6 p. m. The largest flights occurred after rains which fell on the previous day or night. A few individuals were observed to pass nearly every day during August and the first days of September, but in most cases these flights could not be considered as general migrations, for the travel was broken and at times out of the general course. The movements were in a general easterly direction. At times they deviated slightly to the north or south, more often to the south. The prevailing wind during August was from the southeast. The migrations never took place when there was more than a moderate breeze and then the divergence was to the north. During calm afternoons the movement was decidedly to the southeast. When there was any decided air movement the butterflies flew low. No migration was observed when there were heavy clouds or the least precipitation.

The insects moved almost in a straight line and seemingly without effort on calm days at a speed of from 10 to 15 miles per hour, as was judged on several occasions by driving with the flight in an automobile. The movement would slow as the air movement increased. If an individual was disturbed and thrown behind any natural obstruction, it would fly about in an indefinite way until it finally came in contact with the regular

stream and would then proceed with it. When a migrant was flying low enough to encounter natural obstructions it would keep the same general course and move over the object from 6 to not more than 24 inches from it. On calm days, individuals were observed as high in the air as the unaided eye could detect (from 125 to 150 feet).

The number of butterflies in the flights was small at first, but increased until the last flights would literally fill the air. The following excepts are from notes made on the days of the most extensive migrations:

Aug. 1: A large number of butterflies is flying southeast just above the natural obstructions up to as far into the air as the natural eye can detect. Specimens taken by climbing to top of house. Flight began about 5:30 p. m.; none flying at sundown.

Aug. 2: No specimens observed flying this morning. A few are flying at 6 p. m.

Aug. 8: While driving west of town observed butterflies migrating east in about double the numbers of the first flight. They are coming from the cane fields at 4 p. m.

Aug. 9: Thousands of the long-beaks are coming from the cane fields four miles west of town, where they were apparently feeding on the blooms of the cane heads. Many of the cane heads were entirely covered. Heavy migrations east were observed at 5:30 p. m.

Aug. 10: A few long-beaks began passing the laboratory close to the ground, headed in a northeasterly direction. A light breeze was blowing from the southeast. The breeze is stronger at 3 p. m. and the flight has stopped.

Aug. 17: A few of the long-beaks have been observed in flight during nearly all of the still evenings of late, but this afternoon the air is full at 4 o'clock. This is the largest flight observed and at times the sky is almost hidden. All are passing to the east. At 5 p. m. a strong breeze came up from the east and the flight stopped.

Aug. 25: While driving to Uvalde from a point 20 miles away, observed many long-beaks to be flying east between 3 and 5 p. m.

Aug. 28: About 3 p. m. a flight toward the east began. A

light breeze was blowing from the east. The butterflies were flying close to the ground and followed very closely over obstructions. At 5:30 the wind had become calm, the butterflies had arisen in the air as high as could be seen, the lower ones just above the buildings. The flight increased until the air was full at 6 p. m. and lasted 30 minutes. 6:45: not a specimen can be seen.

MIGRATIONS OF 1921

On July 30 at the laboratory, a few individuals were trying to fly against a strong breeze from the southeast; 2 p. m. they flew close to the ground and many alighted on mesquite trees in the back yard. Nothing was observed on July 31, but on August 1, at the laboratory, the long-beaks were migrating in moderate numbers to the east against a moderate breeze from the southeast. Five miles north of town they were flying in greater numbers than at Uvalde, which was a considerable flight. On August 2, only an occasional adult was migrating to the east.

No more migrations were observed during the year at the laboratory, but Mr. A. P. Nicholson, instructor in Sydney University, Sydney, Australia, who was visiting in Uvalde and making a study of the insect fauna, made the following observation on August 27 and 28:

About three miles north of Concan, on August 27, a large number of butterflies, probably the long-beak, was observed flying steadily in the same direction. As near as I can judge, the direction of the flight was south by east, as it was inclined a little more to the east than the direction of the road. The insects were flying at a fair height, on the average about 20 or 30 feet from the ground. The flight was observed from about 5 to 6 o'clock, and on proceeding south along the road, I continued to observe the insects for two or three miles. There had been heavy rains during the day and the flight was observed to have commenced a short time after the weather had cleared.

On August 28, about 6:30 p. m., the insects were again observed but in small numbers. This was at a point about three miles northwest of Uvalde. Again the insects were flying in a general southeasterly direction.

Although a few specimens of *Libythea* have been seen each

year from 1922 to 1924, inclusive, no migrations have been observed at Uvalde since 1921.

FOOD HABITS

Celtis sp. is given as the food plant of *Libythea bachmani.* This tree is not uncommon in this district, but no case of defoliation has been observed.

The adults have been found on several sweets: Aphis honey, fruits, sugars and flowers. They apparently prefer the sorghum flowers to anything else. In many sorghum fields they have been observed in large numbers; at times in 1916 there was scarcely a flowering head that did not have from 1 to 10 of them on it.

Notes on a Migration of the Snout Butterfly (Lepid., Libytheidae).

By ROBERT K. FLETCHER, College Station, Texas.

On September 23d, 1925, there passed through College Station, Texas, a great migration of the Snout Butterfly, *Libythea bachmanni* Kirt. The butterflies were proceeding southward at an estimated speed of eight miles an hour. The wind was blowing from the south at an estimated rate of from three to five miles an hour. The day was warm, 97 degrees F., with bright sunshine. The greatest number of individuals passed through between 2 P. M. and 6 P. M.

There were thousands of butterflies and the most striking features were the manner and steadiness of their flight. The great majority were flying within three feet of the ground. An obstruction in their path, say a board fence or small house, would hardly cause them to perceptibly pause, before they flew over or around it. If one were missed with the net it might swing to one side but the southward flight would be immediately resumed. The migration passed with the steady persistance of a deep-flowing stream.

About twelve hours later a "norther" struck College Station. The temperature dropped to 65 degrees F. while the wind changed to the north and increased to twenty miles an hour.

Did these butterflies migrate because of this "norther"? Were they fleeing southward before it? In other words were they started upon their migration by a drop in temperature probably accompanied by an increase in wind velocity? I do not think so. First, they passed through here about twelve hours ahead of the "norther." Second, how could they have gained so much time on the "norther" with its wind velocity of twenty miles an hour? This is supposing, of course, that the increased cold, which might be considered to have initiated their migration, was accompanied by a wind of this velocity. Third, why did they continue on their way after they had gained twelve hours and against a south wind?

Dr. Alvin R. Cahn, of the University of Illinois, in an article upon the Migration of Animals, (American Naturalist, Nov.-Dec. 1925), offers as an explanation of this phenomenon: "Physiological changes going on within the body, mainly the sex organs." Cannot the southward migration of these butterflies be better explained in this way than by assigning it either to instinct or to an immediate response to a single stimulus?

Dr. L. O. Howard kindly had the species determined for me.

A New Parasitic Bee from Colorado (Hymen.: Coelioxynae).

By T. D. A. COCKERELL and CHAS. H. HICKS, University of Colorado, Boulder, Colorado.

Holcopasites haematurus sp. n.

♂.—Length, little over 7 millimeters; head and thorax black, with appressed white pubescence; region about antennae covered with rather long, white hairs; head and thorax densely coarsely punctured but shining between punctures; labrum black, not carinate, proximal part, at least, covered with long, white pile; mandibles simple, proximal quarter black, distal quarter castaneous; joint 3 of antennae as long as 4+5; antennae black, scape curved and rather coarsely punctured; maxillary palpi 5-jointed, long and slender, proximal joint about as long as two distal joints, second and third slightly longer than last two; labial palpi 4-jointed, first joint much longer than second; tongue long and pointed at tip.

Scutellum conspicuously but obtusely bilobed; mesopleurae bulging, truncate anteriorly and posteriorly; tegulae castaneous;

wings dusky, especially on apical margins; stigma and nervures black; basal nervure meeting nervulus; first cubital cell nearly twice as large as second; second broad, receiving recurrent nervures very near base and apex; legs black; tibial spurs pale red.

First four segments of abdomen entirely red; fifth red with large, round, black spot in the middle; apical segments black; first segment with two widely separated patches of white hair on basal portion and a little on lateral margins; segments 2—5 with basal and lateral patches of white hair; venter with narrow white hair bands; apical plate parallel sided, broadly rounded at apex.

In Crawford's key this species runs nearest to *H. illinoiensis* Robertson, but is larger, with the abdomen brighter red and the apical plate black (red in *H. illinoiensis*). The position of the recurrent nervures is quite different from that of *H. stevensi* Crawford.

Boulder, Colorado, June 21, 1925, at White Rocks (Chas. H. Hicks); on the flowers of a boraginaceous plant. Type in Cockerell collection.

In 1878 Cresson described *Philercmus fulviventris,* collected by Hy. Edwards in California. Ashmead in 1899 made this the type of a peculiar American genus, *Neopasites.* Crawford in 1916 added a second species, *N. cressoni,* also from California. However Ashmead also separated a genus *Holcopasites,* without including any named species. The form he had in hand, to which he had given a manuscript name, proved to be the *Phileremus illinoiensis* of Robertson. For a number of years it was held that this *Holcopasites* could not be separated from *Neopasites,* so that several species were catalogued under the latter name. But Crawford, having access to specimens of the true *Neopasites,* was able to find good distinguishing characters, and accordingly revived *Holcopasites* for all the species except the two cited above. The generic name is really to be credited to Crawford, who (Ins. Ins. Mens. III, 1925, pp. 123-124) first cited a species, and gave a table for the separation of the known forms. Today we know nine species of *Holcopasites,* including the one described above. *Neopasites eamia* Ckll. becomes *Holcopasites eamia.* The species occur from Washington, D. C., to Texas and Colorado, and north to Alberta.

Remarks on Hesperia freija Warren (Lepid.: Rhopalocera).

By E. L. Bell, Flushing, New York.

Under the title "A New European Skipper," Mr. B. C. S. Warren described *Hesperia freija* in the *Transactions of the Entomological Society of London*, parts 1-2, pages lvi-lvii, 1924, and figured it on Plate B, figures 1 to 5; in his paper Mr. Warren states that the species is found "in Colorado at an altitude of 13,000 feet; Labrador and other parts of N. America; and in the extreme north of Europe."

As the title of this paper does not indicate the occurrence of the species in North America, it might well escape notice, and it will therefore be of interest to students of North American Hesperidæ to know of this addition to the described species of our fauna. *Freija* is similar to *centaureae* Rambur and probably confused with it in collections containing Canadian or western specimens. Mr. Warren, however, points out that

H. freija is readily distinguished from *centaureae* by the complete row of white spots between the median band and the white marginal band on the underside of the hind-wings, and their characteristic arched shape. These spots are only very rarely all present in *centaureae* and always of quite irregular formation. Also by the want of the tooth-like white spot, projecting from the outer margin of the hind-wing in *centaureae*, along both sides of nervure 5. This tooth-like projection is never present in *freija*. Further, *freija* is a smaller insect than *centaureae*, and in shape its wings are usually much more elongated than the wings of the latter insect.

Mr. Warren also states that the genitalia of *freija* are distinct from those of *centaureae;* and that Prof. Reverdin figured the genitalia of *freija* as those of *centaureae* in his "Revision of the Genus Hesperia," plate 402, figure 5023.

In response to my inquiry in regard to the type material of *freija*, Mr. Warren has written me that the type specimens of *freija* are a male from Labrador in the collection of Prof. Reverdin, and a female from Lapland in his own collection; his other American records are from specimens in the British

Museum from "Colorado; Alberta; Labrador; Colorado, Bullion Mountains, 13,000 feet." The European *freija*, he states, is confined to Lapland.

In the writer's collection there has been for some time, a female specimen collected on the top of Pikes Peak, Colorado, on June 28th, 1922, by Mr. George P. Engelhardt, of Brooklyn, N. Y., and during the early part of 1925, a few, somewhat worn, males and females were received from Mr. E. J. Oslar, who collected them on Ouray Peak, Colorado, in August; all of these specimens, it was noted, differed from specimens of *centaureae* taken in New Jersey; shortly after the receipt of the Ouray Peak specimens, Mr. Warren's paper came to the writer's notice and a comparison of the specimens with the figures of *freija* left little doubt that they were that species, though some of them showed slight variation in maculation from the figures and all averaged somewhat larger than the New Jersey specimens of *centaureae*, not smaller, as stated in Mr. Warren's paper. However, the writer has no specimens of either species from Europe or Labrador, and their relative size may be different when comparison is made with specimens from other localities.

Specimens from Ouray Peak were sent to Mr. Warren, and he has very kindly made a genitalic examination of the males and pronounces them to be *freija*, though he says that they are not so distinctly marked as his type specimen. It would, of course, be expected that, in view of the widely separated localities from which they came, some variation would be found.

Ceratina dupla (Hym.: Ceratinidae).

Is the little bee, *Ceratina dupla*, like the poor—and the crows? Do we always have it with us? It is among the last to fly in the fall; in midwinter I have seen these small carpenter bees, head down, deep in sumac borings. I should think it would get tired, standing there, waiting for April and the willow blossoms. No wonder they come in crowds to the very first spring flowers, they have been ready for them so long. Specimens have been taken in April, May, July, August, September—doubtless they are present also in June. N. McMURRAY, Clearfield, Penna.

Key to the Known Adult Trombiculas (Adults of Chiggers) of the New World with Descriptions of Two New Species (Acarina, Trombidoidea).

By H. E. Ewing, Bureau of Entomology, United States Department of Agriculture.

In the past but three adults of chiggers (adult Trombiculas) have been known from the New World. The first to be discovered was *Trombicula coarctata Berlese.* This species was described in 1888 and is known to occur in Paraguay and Argentina. The next adult described was *Trombicula splendens* Ewing, which was taken in a tamarack swamp near Portage, Wisconsin, on September 2, 1909, by the writer. The third adult was described by the writer in 1920 as *Trombicula cinnabaris* from specimens taken at East Falls Church, Virginia, and North Beach, Maryland, during the summer of 1919. The larva of this third species has since been reared. It proved to be the common North American chigger, *Trombicula irritans* Riley.

In this paper two more adult Trombiculas are described, one from Peru and one from Panama. These new species are both very large, each being fully twice as long as our common North American chigger.

Members of the genus *Trombicula* may be recognized from all other harvest mites (Trombidiidae) in their adult state by having a deep constriction of the body slightly in front of the middle. They are found in moist soil or in moist organic accumulations, especially in tropical or subtropical woods.

Trombicula alleei, new species.

Color of preserved alcoholic specimen, a brownish cinnibar. Palpi slender, extending almost to the tips of first femora; thumb of palpus only very slightly swollen and scarcely surpassing the claw; distal segment with rather weak but strongly curved palpal claw and on its inside a comb of three, subequal, approximate spines. Eyes large and conspicuous with strongly curved corneas, situated above first coxae and far in front of the pseudostigmatic area. Pseudostigmatic area conspicuous, posterior lobes touching on median line and oval; pseudo-

stigmata small, situated almost on the lateral margins of pseudostigmatic area; pseudostigmatic organs very slender, flagelliform. Setae of body medium, longer on the shoulders and posterior margin. They are colored and provided with conspicuous barbs for about four-fifths of their length, but the barbs toward the tip are smaller.

First pair of legs much the longest, second and third pairs subequal and slightly shorter than the fourth pair. Tarsus I slightly curved, slightly swollen, and very slightly longer than tibia I; tibia I longer than patella I; patella I and femur I subequal; tarsus II and tarsus III each almost one and one-half times as long as tibia II and tibia III, respectively; tarsus IV considerably longer than tibia IV; tibia IV but very slightly longer than patella IV.

Length, 2.5 mm.; width, 1.4 mm.

Type locality.—Barro Colorado Island, Panama, Canal Zone.

Type.—Cat. No. 953, U. S. N. M.

Described from a single specimen taken on Barro Colorado Island, Panama, Canal Zone, by Professor W. C. Allee, of the University of Chicago. This large species is quite different from any adult *Trombicula* heretofore known from America. It is similar, however, to the second species to be described as new in this paper, from which it is differentiated particularly in the nature of the body setae as indicated in the appended key to the known Trombiculas of the New World.

Trombicula peruviana, new species.

Color of preserved specimen a light brownish orange. Palpi slender, reaching to about the tips of first femora; palpal thumb slender, not swollen, and slightly surpassing the palpal claw; penultimate segment very slender and bearing at its free end the rather small palpal claw which is slightly over one-half as long as the segment bearing it. In addition to the palpal claw, the penultimate segment bears on its inside a comb of three long, approximate spines, the middle of which is larger than the other two. Eyes projecting, with strongly curved corneas and situated far in front of the pseudostigmatic area. Pseudostigmatic area large, posterior lobes oval, approximate to median line; pseudostigmata situated near the lateral margin of pseudostigmatic area; pseudostigmatic organs, very slender, flagelliform and with a few pectinations. Setae of body very long, especially on the shoulders and posterior margin; barbed conspicuously for about two-thirds their length, but the tips almost bare.

First pair of legs much longer than the others; tarsus I slightly swollen, almost straight and about one-fourth longer than tibia I; tibia I clearly longer than patella I; patella I and femur I subequal. Tarsus II and tarsus III about one and one-fourth times longer than tibia II and tibia III, respectively. Tarsus IV not swollen, considerably longer than tibia IV, and tibia IV considerably longer than patella IV.

Length, 2.5 mm.; width, 1.5 mm.

Type Locality.—Peru. *Type.*—Cat. No. 954, U. S. N. M.

Described from a single adult collected in Peru, June, 1920, ("El Campaniento, Col. Perene"). This specimen was sent to the United States National Museum from Cornell University, by Professor Cyrus R. Crosby. *T. peruviana*, new species, differs from *T. alleei*, new species, particularly in the nature of the body setae, as has been stated.

Key to the Known Adult Trombiculas of the New World.

A. Eyes present and well developed; setae of body but slightly longer on the posterior margin than on the shoulders, and colored.
  B. Eyes with strongly convex corneas and situated far in front of base of dorsal groove; length of adults over 2 mm.
    C. Setae of body shorter and distinctly barbed to the tips, those on the shoulders about half as long as femur I.....*T. alleei*, new species.
    CC. Setae of body longer and indistinctly barbed toward the tips, those on the shoulders about as long as femur I...*T. peruviana*, new species.
  BB. Eyes with corneas less convex and situated approximate, laterally, to the expanded base of dorsal groove; length of adults about 1 mm. *T. irritans* (Riley).

AA. Eyes vestigial or absent; setae of body usually considerably longer on the posterior margin than on the shoulders.
  B. Posterior lobes of pseudostigmatic area smaller, more or less angulate and situated immediately behind the pseudostigmata; body setae not thinner at their tips than elsewhere....*T. coarctata* Berlese.
  BB. Posterior lobes of pseudostigmatic area larger, rounded, and not situated behind the pseudostigmata; body setae thinner at their tips than elsewhere. .....*T. splendens* Ewing.

A New Acmaeodera from Nevada Infesting Purshia (Col.: Buprestidae).

By W. S. FISHER, U. S. Bureau of Entomology.

Acmaeodera purshiae, new species.

Rather broadly elongate, broadly rounded in front, more strongly attenuate posteriorly, and moderately convex above (nearly straight below and strongly arcuate above when viewed in profile), strongly aeneous above and beneath, with a feebly brownish tinge, and each elytron ornated as follows: a small round yellow spot at humeral angle, a larger rounded yellow spot at base near scutellum, a broad irregular transverse fascia at basal fourth, a slightly oblique fascia at middle, a similar fascia at apical fourth, and a small oblique fascia at apical sixth, which extends narrowly along the lateral margin to apex, all the fasciae extending from the lateral margin to the first or second stria, the anterior two yellow with the median part red, while the posterior two have the external part red and the internal area yellow.

Head nearly flat, with a short longitudinal carina on the occiput; surface densely and coarsely punctate, the punctures round, rather deep, more closely placed on the front, and from the center of each arises a long, fine, erect hair, the intervals smooth and moderately shining; epistoma broadly and deeply angularly emarginate in front, forming a broadly rounded lobe on each side of the emargination; antennae serrate from the fifth joint.

Pronotum strongly transverse, and moderately convex, one and three-fourths times as wide as long, slightly narrower in front than behind, widest just behind the middle, with a broad impression on each side in front of the posterior angles, and a broad, obsolete one in front of the scutellum; sides feebly arcuately rounded, not flattened, and the margins only visible anteriorly from above; anterior margin feebly arcuately emarginate, with a slightly angulated median lobe; base transversely truncate; surface rather densely and coarsely punctate, the punctures rather small and widely separated on the disk, but becoming much larger and more or less confluent toward the sides, and rather densely clothed with very long, fine, erect hairs, the intervals smooth and shining.

Elytra moderately convex anteriorly, and feebly flattened on disk toward apex, only slightly wider than pronotum at base, and rectangular at the humeral angles; sides nearly parallel to middle, where they are slightly arcuately expanded, then

strongly arcuately attenuate to the tips, which are conjointly arcuately rounded, with the lateral margins coarsely serrate posteriorly; humeri strongly developed; surface striato-punctate, the striae not impressed on the disk, but becoming deeply impressed toward the apex and sides, with the punctures coarse and distinctly separated in the discal striae, but more or less confluent at the sides, the intervals flat, and from two to three times as wide as the striae on disk (the sutural intervals not expanded anteriorly), with a single row of widely separated punctures from each of which arises a very long, erect, inconspicuous hair.

Abdomen beneath sparsely and not very coarsely punctate on the basal segment, the punctures becoming coarser and more numerous on the apical segments, moderately clothed with long, semierect, cinereous hairs, and the intervals smooth and shining; last segment acutely rounded at apex, with a distinct subapical carina. Prosternum rather densely and coarsely punctate; anterior margin with a distinct tooth on each side of the middle; prosternal process convex, and the sides parallel to behind the coxal cavities, twice as wide as the cavities, and broadly rounded at apex.

Length, 7-8 mm.; width, 2.5-3 mm.

Type locality.—Reno, Nevada.

Type and *paratype.*—Cat. No. 28323, United States National Museum.

Described from two specimens. The type was cut from a cell in a dead twig of *Purshia tridentata,* January 4, 1923, on the slope of Mount Rose, five miles southwest of Reno, Nevada, at an altitude of 5,000 to 6,000 feet, by H. S. Barber, and the paratype was reared June 27, 1923, from dead branches of the same plant collected at the type locality by Mr. Barber. This plant is locally called "Buck Brush" and is very abundant on the hills around Reno. Many of the plants show considerable work of this beetle, as well as that of various other species of borers.

This species belongs to the *sinuatae* group as designated by Fall (Jour. N. Y. Ent. Soc., Vol. 7, 1899, p. 5), and in his table of this group runs to *fenyesi* Fall, from which it differs in having the elytra ornated with distinct transverse yellow and red fasciae.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1926.

The Need for Systematic Entomologists.

In the News for March, page 93, we published some observations and recommendations of the International Congress of Entomology held at Zürich last July to the effect that present means are inadequate for the exact determination of the immense number of insects of which Applied Entomology must take cognizance; everywhere the systematic specialist is overburdened and his load has become intolerable; neither Systematic nor Applied Entomology has yet received due recognition in academic circles; that the teaching of Systematic Entomology at Universities be adequately provided for by the establishment of chairs especially devoted thereto; that meritorious systematic work should be regarded as qualifying candidates for ordinary and advanced degrees at Universities; that immediate steps should be taken to increase the number of entomological assistants, both systematic and technical, in Museums and that this should be done in a manner proportionate to the amount of specific work entailed.

In his address on "The Smithsonian Institution, its Function and its Future" delivered before the American Association for the Advancement of Science, Jan. 1, 1926, and published in *Science* for Feb. 5, Dr. Austin H. Clark said (p. 153):

"It is the duty of the Bureau of Entomology to protect us from the ravages of insect pests. But work in economic entomology requires as a starting point an accurate identification of the insect to be studied. . . . The accurate identification of an insect is by no means a simple matter. In the first place there are more than six hundred thousand different kinds of insects known . . . new kinds are being described at the rate of about six thousand every year. . . . Unless one happens to be an expert in the particular group concerned it is almost hopeless to attempt to trace out [a given insect] . . . Many insects, sometimes of widely different habits, are so very similar that it is practically impossible to distinguish them without an actual comparison by an expert with specimens in a reference collection. . . We can see from all this that economic entomology must have the services of a staff of competent men

trained to note the differences between the various kinds of insects. The Smithsonian proposes to aid in maintaining such a staff of workers in pure research. As a natural corollary to this work, the Smithsonian will publish monographs in wnich the widely scattered information will be presented as the basis for efficient advance.

The entomologists clearly recognize the existence of a shortage of systematists and the necessity for supplying the demand. Can those having the power to meet this need be made to see the present difficulties of the situation and provide a living wage for each of those human beings who are willing and desirous of devoting themselves to insect taxonomy?

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

Personal Mention.

Science for Feb. 12, 1926, stated that Prof. G. F. Ferris, of the department of entomology of Stanford University, has returned to the University with a collection of plants and insects from Tres Marias, a group of islands off the west coast of Mexico, and that

Dr. Raymond C. Shannon, of the U. S. Bureau of Entomology, left for Buenos Aires on Jan. 30, where he is going to study the mosquitoes of the region under the auspices of the Argentine government.

Mr. Chas. T. Greene, of the U. S. Bureau of Entomology, has gone to Panama to make a special study of the fruit flies and particularly *Anastrepha*. He expects to be there for about three months.

"Butterflies of California."

The work which is in process of publication under this title bears promise of issuance in about three months. When completed, it will contain over sixty full page colored plates and numerous half tone figures. Fifty-one of these color plates are now completed. Sets of these plates which included Nos. 2 to 38 were distributed to important Libraries, Museums, and specialists in the United States and Canada, and the individual plates, as far as published, are on sale at the Dawson Book Shop, 627 So. Grand Avenue, Los Angeles.

Dr. John Adams Comstock, the author, who has for six years been the Director of the Southwest Museum has resigned from

that position and reentered the practice of medicine. He will retain the post of Honorary Curator of Entomology, and his numerous other scientific connections, and thus have more time at his disposal to devote to the study of the lepidoptera. Mr. Charles L. Haskell succeeds Dr. Comstock as Director of the Southwest Museum.

Cocoon Spinning (Hymen.: Parasitica).

Last August (1924), a big luna larva broke out in parasites and it was pleasing to watch the tiny things spin cocoons. The head of the translucent, whitish grub makes a break in the green skin of its host, pushes through, and, moving from side to side, gradually works its way out.

The caudal end of the little creature rests on the big worm, the body bends over and the spinneret begins to work: the cocoon being started at the lower end. The head moves up a certain distance and a strand of silk comes out, the head goes down and the loop is fastened. The process reminds one of pulling taffy. From side to side the weaving goes on until it extends up well above the spinner's head, like a netted wall standing up in front of the worm. One larva seemed to make six loops each way and another turned after every ninth loop. When spinning this coat there is a certain degree of regularity: each loop seems to be of the same length—but they are not joined to the preceding row very exactly and it looks like a curly mass of white rather than a network when completed.

At the summit the insect makes a few circles, making the loops completely around one way, then turning the head and making them completely around the other way. It thrusts its head through this circle, crawls in and down until its head reaches the place where the spinning was begun. Its back is now covered with the dainty, fuzzy tangle of threads. For an instant the larva is standing on its head, but is apt to drop over, so the bare venter is next the back of the luna. The larva stoops over, resumes spinning and makes the second side of the outer part of the cocoon in precisely the same manner as the first, only fastening the rows on the sides to the other portion each time before it turns.

Next a few little stitches are made at the end and a few short stitches down to or below the center: a long stitch is drawn up to the top. Again little stitches go down and one long one comes up. The one-half is gone over in this fashion, then the larva turns around and weaves at the other end in the same way. By this time it is getting pretty well tied up

in a cage and it is not easy for the eye to follow its movements. But to see how the small ichneumon wove the outer coat crosswise, joining it lengthwise and the next coat it wove lengthwise, joining it across the middle, was interesting.

The old luna must be a patient creature as it hangs for days while fifty or more of these active worms come through its skin and weave their nests. If the luna would shake a bit, they would all tumble off, for after the spinning is started they are never closely attached to the host. This big worm is covered with wounds, some of them soon get black, perhaps it feels too sick to be anything but quiet.

N. McMURRAY, Clearfield, Pennsylvania.

Occurrence of Morellia podagrica Lw. in North America. (Dip.: Muscidae).

On June 27, 1924, I collected a male of the above European species at Marshfield, Oregon; and on July 25 I collected a male and a female at Summit Station, Montana, at the south edge of Glacier National Park, altitude 5200 feet.

After identifying the species, being impressed by the wide distance between the two localities, it occurred to me to examine the western material of the common nearctic *Morellia micans* Mcq. in the National Museum (now including my own western material), to see if the species had not been previously collected, and not noticed. However, I found no mixture of *podagrica* in the collection; the three specimens mentioned are all I know from North America, and it will have to pass as a coincidence that I found it twice on a single western trip after collecting in the West for the greater part of the last thirty years.

The genus *Morellia* has been discussed and tabulated by Malloch in *Annals and Magazine of Natural History,* 1923, 520. From *Pyrellia* it differs in having no ventral bristle on the middle tibia. Our two nearctic species (there are several neotropical) differ in the male by such striking characters that they are very easily separated. In *micans* the male middle tibia is thickened apically, warped so as to be concave lengthwise behind, and has on its outer edge a row of delicate dense upright cilia, longer near the base; the hind tarsus has on the upper surface a row of upright hairs about twice as long as the thickness of the segments. In *podagrica,* a noticeably larger species, the tip of the middle femur has a tuft of stout bristles situated on a swelling; the middle tibia is slender at the extreme base, then suddenly expanded into a hump on the outer side at one-sixth its length, which bears numerous small

spiny hairs turned backward. The hump gradually diminishes toward the tip of the tibia, and there are some short, erect, spiny hairs all along the outer edge. The hind tarsus does not have striking hairs above.

The females are not easily separated. I identified my Montana specimen from collecting it with the male and not getting males of *micans* at the same time. I have seen but one European female, which is extremely like that of our abundant *micans*. *Podagrica* was described by Loew in Wiener Ent. Monatsschrift, I, 45, 1852, as a *Cyrtoneura*.

J. M. ALDRICH,
U. S. National Museum, Washington, D. C.

Entomological Literature

COMPILED BY E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph beginning with (N). Those pertaining to Neotropical species only will be found in paragraphs beginning with (S). Those containing descriptions of new forms are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Papers published in the Entomological News are not listed.

4—Canadian Entomologist. **6**—Journal, New York Ent. Soc. **7**—Annals, Entomological Society of America. **10**—Proc., Ent. Soc. Washington. **19**—Bull., Brooklyn Ent. Soc. **55**—The Pan-Pacific Entomologist. **77**—Comptes Rendus, Soc. Biologie, Paris. **78**—Bull. Biol. France et de la Belgique. **108**—Jour. Washington Acad. Sci. **111**—Archiv f. Naturg., Berlin. **133**—Jour. Experimental Zool. **135**—Quart. Jour. Microscop. Sci. **154**—Zoolog. Anzeiger.

GENERAL.—Baerg, W. J.—Effect of the venom of some supposedly poisonous arthropods of the canal zone.—**7**, xviii, 471-8. **Casey, T. L.**—Obituary by F. E. Blaisdell.—**55**, ii, 90-1. **Cushman, R. A.**—Location of individual hosts versus systematic relation of host species as a determining factor in parasitic attack.—**10**, xxviii, 5-6. **Herms, W. S.**—Entomological observations on Fannings and Washington Islands,

together with general biological notes.—**55,** ii, 49-54. **Rohwer, Baker & Ball.**—Entomological taxonomy: its aims and failures.—**108,** xvii, 53-67. **Weiss, H. B.**—The insects of the Panchatanatra.—**6,** xxxiii, 223.

ANATOMY, PHYSIOLOGY, MEDICAL, ETC.—Gatenby, J. B.—Spermatogenesis in spiders and the chromosome hypothesis of heredity.—Nature, cvii, 233-4. **Hilton, W. A.**—Some remarks on the peripheral nervous system of insects.—**7,** xviii, 537-42. **Pagden, H. T.**—Parthenogenesis in Methoca ichneumonides.—Nature, cxvii, 199. **Sokolska, J.**—Les heterochromosomes pendant la spermatogenese de araignee domestique (Tegenaria domestica).—Bul. Intern. Acad. Polon. Sci. et Let., 1925, (B), 477-91. **Weber, H.**—Das problem der gliederung des insektenthorax.—**154,** lxv, 233-48.

ARACHNIDA AND MYRIOPODA.—Barrows, W. M.—Modification and development of the arachnid palpal claw, with especial reference to spiders.—**7,** xviii, 483-525. **Larson, A. O.**—Further notes on human sufferings caused by mites, Pediculoides ventricosus.—**55,** ii, 93-5. **Millot, J.**—Contribution a histophysiologie des araneides.—**78,** Suppl., viii, 238 pp. **Pavlovsky, E. N.**—Studies on the organization and development of scorpions. V. The lungs.—**135,** lxx, 135-46. **Turchini et Millot.**—Sur la fluorescence en lumiere ultraparaviolette filtree (lumiere de Wood) des glandes sericigenes et de certains elements figures du sang des araignees.—**77,** xciv, 171-73.

(N) ***Chamberlin R. V.**—Notes on some centipeds and arachnids from the Carlsbad cave of New Mexico.—**10,** millipeds from Utah.—**55,** ii, 55-63. ***Crosby, C. R.**—Some xxviii, 1-5.

THE SMALLER ORDERS OF INSECTA.—Handschin, E.—Subterrane collembolengesellschaften.—**111,** 1925, A, 1, p. 119-38. **Wachter, S.**—Hatching of the eggs of Peripsocus californicus.—**55,** ii, 87-9.

(N) ***Ferris, G. F.**—The mallophagan family Menoponidae.—Parasitology, xviii, 1-3.

(S) ***Snyder, T. E.**—Five new termites from Panama and Costa Rica.—**10,** xxviii, 7-16.

ORTHOPTERA.—Davis, W. T.—Grasshopper Melanoplus differentialis on Staten Island, N. Y.—**19,** xx, 199. **Kloska, T.**—Das haemolymphysystem in kopfe von Blatta

orientalis.—Bul. Intern. Acad. Polon. Sci. et Let., 1924, (B), 461-67. **Kuhl, W.**—Die variabilitat der abdomenalen koerperanhange bei Forficula auricularia.—**154,** Suppl., 1, p. 145-52. **Weiss, H. B.**—Cockroaches for tetanus and indigestion.—**6,** xxxiii, 232.

HEMIPTERA.—Abbott, C. E.—Associative memory in the larvae of Anax junius.—**7,** xviii, 533-6. **Beamer, R. H.**—Notes on the oviposition of some Kansas cicadas.—**7,** xviii, 479-82. **Morrison, H.**—Scale insects.—Sci. Month., 1926, 243-46. **Weiss, H. B.**—Distributional records of Comstock's mealy bug in N. J.—**6,** xxxiii, 237.

(N) **Ferris, G. F.**—Observations on the Chermidae.—**4,** lviii, 13-20. ***Gillette & Palmer.**—Two n. sps. of the genus Lachnus.—**7,** xviii, 526-32. ***Knight, H. H.**—New Rhinacloa and three new sps. of Lepidopsallus (Miridae).—**19,** xx, 225-8. ***Teague, M. M.**—Review of the genus Aclerda (Coccidoidea).—**7,** xviii, 432-44.

(S) ***Metcalf & Bruner.**—Membracidae of Cuba.— **19,** xx, 203-214.

LEPIDOPTERA.—Barber, G. W.—Observations on the response of adults of the European corn borer to light in egg laying.—**7,** xviii, 419-31. **Bell, E. L.**—Hylephila phylaeus.—**19,** xx, 231. **Gerould, J. H.**—Inheritance of olive-green and blue-green, variations appearing in the life-cycle of a butterfly, Colias philodice.—**133,** xliii, 413-28. **Hamlin, J. C.**—Note on opuntia insects.—**55,** ii, 54. **Harrison & Garrett.**—Induction of melanism in the lepidoptera and its subsequent inheritance.—Proc. R. Soc. London, (B), xcix, 241-63. **Learned, E. T.**—Notes on the early stages of Estigmene prima (Arctiidae).—**4,** lviii, 1-2. **Rogers, W. P.**—Note on Pieris rapae and Brephos infans.—**19,** xx, 228. **Wood, W. C.**—Hints on mounting lepidoptera.—**19,** xx, 229-31.

(N) **Barnes & Benjamin.**—New U. S. lepidoptera records with notes.—**10,** xxviii, 16-21. ***Barnes & Benjamin.**—Changes in the synonymy of L. arising from examination of some types in the Brooklyn Museum. (Phalaenidae & Pyralidae).—**19,** xx, 189-99. ***Barnes & Benjamin.**—Notes on Lophoceramica artega (Phalaenidae). A new pyralid from California, with notes on Decaturia pectinalis (Pyralidae). The hyperboreus group of Hepialus (Hepialidae). —**55,** ii, 63; 64; 81-4. **Bell, E. L.**—Remarks on Myscelus epigona and Eudamus casica (Hesperiidae).—**6,** xxxiii,

227-32. ***Engelhardt, G. P.**—Studies of N. A. Aegeriidae.—**19,** xx, 215-17. **Meyrick, E.**—Genera insectorum. Fasc. 184, 290 pp. Heterocera. Fam. Gelechiadae. ***Nakahara, W.**—Some Rhopalocera of eastern U. S., including three new forms.—**19,** xx, 221-4.

DIPTERA.—Harnisch, O.—Vergleichende studien ueber den eisenstoffwechsel der chironomidenlarven.—**154,** Suppl., 1, p. 96-104. **Kemper, H.**—Morphogenetische untersuchung des tracheensystems von Psychoda phalaenoides.—(Aus dem Zool. Inst. der Westfael. Wilhelms-Univ. zu Muenster i. W., Zoologie, 34 pp. **Liang, S.**—Morphologie des hypopygiums, der mannlichen genitaldruesen und des verdauungs-systems von Thaumastoptera calceata (Tipulidae).—**111,** 1925, A, 1, p.1-31. **Simm, K.**—Phytomyza lateralis. Ein beitrag zur kenntnis der morphologie und biologie.—Bul. Intern. Acad. Polon. Sci. et Let., 1924, (B), 735-52. **Sturtevant, A. H.**—Seminal receptacles and accessory glands of the diptera, with special reference to the acalypterae.—**6,** xxxiii, 195-215. **Zuercher, L.**—Dr. L. Zuercher's dipterenausbeute aus Paraguay.—**111,** 1925, A, 1, p. 34-45.

(N) **Johannsen, O. A.**—Beris quadridentata Walker (Stratiomyidae).—**19,** xx, 214.

COLEOPTERA.—Hatch, M. H.—Habitats of coleoptera.—**6,** xxxiii, 217-23. **Kirk & Knull.**—Annotated list of the coleoptera of Pennsylvania.—**4,** lviii, 21-26. **von Lengerken, H.**—Beeinflussung des lebenszyklus von Tenebrio molitor durch aeussere faktoren.—**154,** Suppl., 1, p. 132-5. **Pieron, H.**—La persistance a obscurite du rythme lumineux du lampyre.—La Feuil. des Natural., Paris, xlvi, 186-88. **Strouhal, H.**—Missbildungen bei einer coccinellidenlarve.—**154,** lxv, 113-16. **Van Dyke, E. C.**—Where to find Zacotus matthewsi.—**55,** ii, 95.

(N) ***Blaisdell, F. E.**—Studies in the Melyridae. V.—**4,** lviii, 8-13. ***Blaisdell, F. E.**—A New Melanastus from Texas. (Elateridae).—**10,** xxviii, 22-23. ***Blaisdell, F. E.**—Revised check-list of the sps. of Eleodes inhabiting America, north of Mexico, including Lower California and adjacent islands.—**55,** ii, 77-80. ***Brown, W. J.**—New sp. of Syrigodermella (Scarabaeidae).—**19,** xx, 200-2. ***Champlain & Knull.**—Two new N. A. coleoptera. (Buprestidae and Cerambycidae).—**7,** xviii, 469-70. ***Hatch & Angel**—A new N. A. Necrophorus.—**6,** xxxiii, 216. ***Schaeffer, C.**—New sps. and var. of N. A. Cassidini (Chrysomelidae).—**6,** xxxiii,

233-7. ***Schott, F. M.**—On some C. in New Jersey.—**6,** xxxiii, 224-5. ***Van Dyke, E. C.**—New sps. of Carabidae in the subfamily Harpalinae, chiefly from western N. A.—**55,** ii, 65-76.

HYMENOPTERA.—Lo Liu, C.—Observations on the acroglossal buttons and on the submentum of hymenoptera.—**7,** xviii, 445-55. **Lozinski, P.**—Ueber die spinndruesen der wespenlarven. I. Entwickelung und anatomie.—Bul. Intern. Acad. Polon. Sci. et Let., 1924 (B), 715-34. **Weiss, H. B.**—The bee, the wasp, the ant, insects of the physiologus.—**6,** xxxiii, 238-42.

SPECIAL NOTICES.

Report of the international conference of phytopathology and economic entomology. Holland, 1923. This report of 290 pp. is of special interest to economic entomologists, but the following papers therein are among those which may be of interest to others: Contribution a l'étude de la famille "Aphididae Pass." Par L. Gaumont; Die anatomischen und mikrochemischen veraenderungen des kartoffelleptoms. Von Dr. von Brehmer. (The report contains for the most part papers on potato pests.)

CONCERNING THE HABITS OF INSECTS. By F. BALFOUR-BROWNE, M. A., etc., Lecturer in Zoology (Entomology) in the University of Cambridge. Cambridge at the University Press 1925. 7¼ x 5 inches, pp. x, 169, 9 pls., 2 maps, 4 text figs., 6s. net.

"This book is the outcome of a course of lectures 'adapted to a juvenile auditory' delivered at the Royal Institution during the Christmas holidays 1924. Its object is not so much to describe the life histories of various insects as to explain how these life histories were worked out, in the hope that others may be encouraged to do similar work." The methods employed and the histories studied are based very largely on the author's own researches, which have been published in various scientific journals. It would have added much to the usefulness of the present well-written and entertaining volume if references to the places of publication of these researches had been given. In Lecture I, Insect Collecting and What it may lead to, dealing with the general and local distribution of aquatic beetles in the British Isles, the author has sketched his own entomological biography and how he was led to study problems of insect communities and of geographical distribution. Lecture II, The

Habits of Bees and Wasps, is suggestive of methods for rearing, observing and experimenting with a few of the attractive solitary species. Lecture III, The Habits of Caterpillars, is literally strung upon threads of their silk, tracing the development of shelters made by caterpillars which herd together from a mere carpet, then as a general web spread indefinitely over the food material and then as a definite fixed home. The author was, we believe, the first to publish the complete life-history of any dragonfly from egg to imago (Proc. Zool. Soc. London, 1909, pp. 253-285). It is very appropriate, therefore, that Lecture IV is on The Habits of the Dragonfly, wherein the main outlines of his findings are retold, with additions and comparisons from other sources, and with, as in the other lectures, suggestions as to problems still to be elucidated.

Mr. Balfour-Browne also first worked out the complete life history of *Dytiscus lapponicus* and so The Habits of the Water Beetle forms the subject matter of Lecture V, including also *Hydrophilus piceus, Hydrous caraboides* and *Donacia.* Emphasis is laid on the fact that "as in the case of the dragonflies, differences in structure and habit may occur in closely related forms, differences which frequently appear to be so trivial and yet which mean a great deal to the insects themselves in the way that they fit into the communities to which they belong."

"It may well be asked by some of those who have listened to the earlier lectures of this course, What is the use of all the work which has been described? And I can answer without any feeling of shame that, so far as I know, the work is of no use whatever and that my only object in undertaking it was that I was curious and wanted to know how the insects lived.

"I believe that there is still an ancient Physical or Mathematical Society which, at its annual banquet, drinks the following toast: 'Here's to the Society; let no one ever do anything that is of any use to anybody.' This sounds a very selfish, unchristian wish but it is the true scientific attitude—to do the work for the work's sake and never mind whether or not it is going to be useful.

"But a large amount of work done for its own sake turns out to be of use and, although we seldom recognise what we owe to the humble naturalist, he has contributed largely to our health and comfort."

In these paragraphs Lecture VI, The Habits of Insects and the Work of Man, opens and it continues with illustrations of the last sentence quoted which are much more familiar to us in America than many of the relations described in the preceding lectures—insects of importance in agriculture, the mosquito

and malaria and yellow fever, Havana and Panama, parasitic insects and the balance of nature.

Although originated for a "juvenile auditory", the book has not been "written down" and no adult need scorn its style or its contents. The insects described, although British, are not viewed from any local standpoint but interpreted in a broad, biological way. The summary and the quotations given above justify the belief, we hope, that this is "a different kind of book" and one which is well worth reading.

P. P. CALVERT.

OBITUARY.

EDWARD ALBERT BUTLER, author of *A Biology of the British Hemiptera-Heteroptera*, "a landmark in the progress of the ecological study of the Hemiptera and destined to become a classic of the subject," died at Clapham, England, November 20, 1925. He was born at Alton, Hants, March 17, 1845. From 1865 to 1919 he taught, or was vice-principal, in schools in Hastings and Tollington, London. His interest in the Hemiptera was due to the suggestion of Edward Saunders, after whose death in 1910 he became the foremost authority on British Heteroptera. His interest lay entirely in biology and life histories, not at all on the systematic side. His collections have been acquired by the British Museum of Natural History. A portrait accompanies an obituary notice in the *Entomologists' Monthly Magazine* for Jan., 1926, and another notice is in the same month's *Entomologist*.

The death of DR. SIGMUND EXNER in Vienna, on February 6, was announced in *Science* for February 26. According to *Who's Who in Science International* 1913, he was born in 1846, educated at Vienna and Heidelberg, professor of physiology in the University of Vienna and was a Hofrath and an Obersanitätsrath. To entomologists he was well known for his work *Die Physiologie der facettirten Augen von Krebsen und Insekten*, Wien, F. Deuticke, 1891. Some of his earlier papers on vision by compound eyes are listed in Packard's *Textbook of Entomology* p. 263. The frontispiece of his book of 1891 is an

actual photographic print of the imago of a window and a church steeple seen through it, as obtained by a camera and a microscope attached to the lenses and crystalline cones of an eye of *Hydrophilus*. He distinguished between appositional and superpositional images formed by compound eyes of insects in day and at night respectively, and gave figures showing the different positions occupied by the pigment in these two kinds of eyes.

In the NEWS for July, 1925, p. 224, the death of Prof. G. B. GRASSI was recorded. From an address delivered in his honor by Prof. F. Silvestri* we summarize his career as follows. Grassi was born in Rovellasca, Province of Como, March 27, 1854, was educated in schools at Saronno and Como, at the Universities of Pavia under Golgi, Messina under Kleinenberg, Heidelberg under Gegenbaur and Bütschli and Wurzburg under Semper. In the autumn of 1883 he was made professor of zoology, anatomy and comparative physiology in the University of Catania and in 1895 he was called to that of Rome. From his earliest studies on intestinal worms he proceeded to those on protozoa (especially of termites), on the misdeeds of the flies (Malefizi delle Mosche 1883) as carriers of eggs of worms and of spores of fungi, on the embryology of the bee, the morphology and phylogeny of the Arthropods, the biology of Termites, on the connection of malaria with *Anopheles*, the life history of *Phlebotomus*, on *Phylloxera* in Italy, as well as important researches on Chaetognaths, the development of the vertebral column and of marine eels. From 1908 on he was a member of the Italian Senate.

In his study of the embryology of the bee he made use of the method of sections, then relatively new, and asserted the bipolar origin of the endoderm, from an anterior and a posterior plate in opposition to the views then held of its origin from yolk cells. Between 1884 and 1889 he made a complete study of the Thysanura, leading to the conclusion that they are the most primitive insects, of *Scolopendrella* and of the arachnid which he discovered and described as *Koenenia*

* Onoranze a Battista Grassi Discorso del Prof. Filippo Silvestri. Roma Tipografia del Senato 1925. 47pp.

mirabilis. For his work with the aid of Sandias, on the constitution and development of the society of termites, together with his studies on the Muraenoid eels, he was awarded the Darwin gold medal of the Royal Society of London. He believed himself to have shown that the neoteinic or complemental royalties of Termites become such in consequence of a special diet to which they are subjected by the workers. In 1898-1900, he gave especial attention to the malarial problem, showing that all the Italian species of *Anopheles* (but not of *Culex*, *Phlebotomus* or *Mycterotypus*) propagate malaria and followed the entire cycle of development of *Plasmodium* in *Anopheles claviger*, finding it to be identical with that described by Ross for *Proteosoma*. His results of this period are summed up in his *Studi di uno zoologo sulla malaria* (1900), followed by a second, enlarged edition in 1901, which appeared also in German. In 1917 he returned to the malaria problem on which he continued to publish to the time of his death, on May 5, 1925.

JOHN L. HEALY of Chicago, Illinois, passed away very suddenly on January 22, 1926. He was born at Bolton, Vermont, May 12, 1864, but spent his youth at Belleville, Illinois, removing to Chicago in 1882.

He was an enthusiastic collector of Lepidoptera from boyhood and often recounted his experiences in Belleville. His present collection was started about 1891. Mr. Healy formerly had many correspondents but, owing to ill health, his activities lapsed for a time, although he always kept in touch with local collectors. During the last three or four years, when his health improved somewhat, he devoted considerable time to his own collection. A year or two ago he transferred it to the Chicago Academy of Sciences reserving the right to work with it at will and it now passes into the hands of the Academy without qualification. He was one of the organizers of the Chicago Entomological Society in 1899, and at the time of his death was its presiding officer. He will be missed by the local Entomologists for a long time to come.

He left surviving him his wife and two children, both married.

ALEX. K. WYATT.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Will send volumes XXV (1921) and XXVII (1923), Revista Chilena de Historia Natural, in exchange for School Entomology by Sanderson & Peairs and Classbook of Economic Entomology by Wm. Lochhead (latest editions) sent to me by registered mail. Will give vol. XXV also for a copy of American Insects by V. L. Kellogg (last edition) sent registered. Prof. Dr. C. E. Porter, Casilla 2974, Santiago, Chile.

For Exchange—A fine collection of butterflies of the Indian region, 1300 species, including many rarities. Apply to Dr. C. F. C. Beeson, Forest Research Institute, Dehra Dun, India.

Wanted—For Cash. U. S. Bureau of Entomology Technical Series 5; and Bureau Circular 3, 27, and 132.—State Entomologist, Capitol Annex, Madison, Wisconsin.

Wanted to buy or exchange **Named** American Chrysids and Ruby Wasps. Mortimer L. J. Higgins, 36 Imlay St., Hartford, Connecticut.

I wish to exchange butterflies with collectors in the United States.—V. W. A. Moller, Frederick St., Taninga, Brisbane, Australia.

Wanted—Canadian Entomologist, Vol. 2 (1869) to 9 (1877); Vol. 12 (1879); Nos. 5, 9 of Vol. 17 (1885); No. 3 of Vol. 18 (1886); Vol. 19 (1887); Zoe, No. 12 of Vol. 5; Proc. Ent. Soc. Washington, Vol. 1 (1899) to 5 (1903); **all** in exchange for **Cetonides** and **Longicorns** from New Guinea or other countries. Also entom. literature could be given. Address Deutsches Entom. Institut (Walther Horn), Gossler Str. 20, Berlin-Dahlem, Germany.

Wanted for cash all kinds of hibern. pupae, such as P. troilus, rutulus, daunus, zolicaon, eurymedon, etc., A. orizaba, jorulla, S. columbia, californica, C. angulifera, A. luna, E. imperialis, C. regalis, also Sphingidae, etc. Send list with prices to Max Rothke, Scranton, Pa. (R. F. D. No. 2).

Wanted—Living pupae or cocoons of American moths and butterflies. Collectors communicate, Head & Co., Burniston, Nr. Scarborough, England.

Will exchange **Coleoptera** of Illinois for those from other parts of the continent.—Carl Selinger, 4419 Dover St., Chicago, Ill.

Thysanoptera: A small pocket collecting outfit containing vials, brush and memo sheets, sent free to entomologists interested in collecting thrips especially in foreign countries. Dudley Moulton, 244 California Street, San Francisco, California.

Wanted—Bombyliidae and Trypetidae. Will exchange local Bombyliids and Trypetids and other Diptera. Harold C. Hallock, Japanese Beetle Lab., Riverton, N. J.

For Exchange: Butterflies and moths from all parts of the world. Wanted: Sphingidae, Arctiidae, Catocalinae. Henry Wormsbacher, 1357 St. Charles Ave., Lakewood, Ohio.

Wanted for Cash—Saturnidae of the WORLD. A few duplicates for sale. W. Judson Coxey, Drexel Bldg., Philadelphia, Penna.

I will collect Coleoptera, Lepidoptera, Hemiptera, etc., in southwest Arkansas for those so interested. Miss Louise Knobel, East 3d St., Hope, Arkansas.

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